THURSDAY, MAY 24, 1888.

THE POLYTECHNIC INSTITUTE.

EVERY middle-aged inhabitant of the British Islands must recall more than one occasion when the mind of our country has been strongly stirred on the question of national defence. The adverse evidence of an expert, a rousing article in a newspaper, has often awakened general anxiety of more or less continuance, and followed by more or less adequate results. But it is far more difficult to awaken any widespread concern on behalf of those great abiding national interests which it is our charge and heritage to defend. And yet there are signs of no uncertainty which must to all thoughtful and instructed minds, from many directions, suggest the question whether that industrial leadership which has hitherto made our small and crowded country the world's workshop, and almost the world's mart, is not slipping from us. This is a question not of more or less wealth or luxury, but of very livelihood to the masses of the people under the special conditions of our national existence. If work ceases to come to a workshop, there is nothing for it but prompt dispersal of the workmen. All authorities seem agreed that the population of five or six millions inhabiting England and Wales in the time of Queen Elizabeth represents pretty nearly what their areas can sustain as agricultural, self-supporting countries. But the population of England and Wales alone was shown by the census of 1881 to have reached nearly twenty-six millions. So that seven years ago there was in the southern half of Great Britain an excess of twenty millions above what the country could reasonably support, except as a community of artificers and traders, and general carriers, by import and export, of the world's merchandise. It needs only a glance into past history to see that this, while an enviable position for a nation while prosperity lasts, is practical extinction when the channels of commerce are turned, or lost advantages have transferred production to new centres. Macaulay's fancy picture of the New Zealander sketching the ruins of St. Paul's from the broken arches of London Bridge seems of very little concern to the present citizen, whose ears are deafened with the ceaseless roar and traffic of the streets. And yet precisely that doom of silence and decay has befallen many a proud mother-city of which now "even the ruins have perished." It would far exceed present limits to show in detail how many articles of our own immemorial production we ourselves now largely import, because the foreign workman produces them better, or produces them at less cost. The evidence will be fresh in the recollection of the readers of this journal. Neither can they fail to recall with what persistence we have pointed out the remedy. There is but one real remedy: the better training of the workman; and—if we may be allowed to say it—of his employer too. Everyone who, without prejudice, has opportunity to watch a fair specimen of the British workman at his work must admit that the raw material is as good as ever it was; that in the quantity and quality of the work he can turn out in a given time, few of any nationality can equal, and none surpass him. But in the training he receives, and in the opportunities of his receiving it, there is much left to be desired. And, meantime, there is not only the grave fear, but, in many branches of industry, the accomplished fact, that other nations may and do outstrip us in the race.

Perhaps there is some belated merit in seeing that now; but all honour to those who, with heart and means to labour towards the better training of our artisans, devoted themselves to the endeavour when the need for it was less comparatively obvious. Honour especially to one man, Mr. Quintin Hogg, who, close upon a quarter of a century ago, at an age when most young men are concentrating their best energies on cricket, or football, or lawn tennis (all good things in their way), made it his life's task to raise the skilled workman of London, and furnish him more fully for his labour, for his own sake and for ours. Probably most of our readers know how that small enterprise has become a great one indeed, with the old Polytechnic for its present home and centre, and with a fuller variety of classes and branches, and with a greater comprehensiveness of scheme, than we can now attempt to describe. But all has hitherto rested on the shoulders, and been sustained by the purse, of Mr. Hogg himself, who, during the past six years, has spent, speaking broadly, some £100,000 in establishing and sustaining these admirable schools. But the time has now come when so great a burden, for the work's sake as well as for his own, should no longer depend upon the means and life of a single man; and there is now an opportunity of securing for the Institute something like an adequate endowment. The Charity Commissioners have offered to endow it with £2500 per annum on condition that the public find £35,000 as a supplementary fund. £18,000 have already been promised by the personal friends of the founder; but £17,000 still remain to be raised—a large sum no doubt, but a small one compared to our still unrivalled resources, and the national value of the Institute, not only for its own immediate results, but as a model for similar efforts in all the great centres of our industry. Those who believe in science—that is, in faithfully accurate and exact knowledge—as the only sure basis for any national prosperity that is to bear the stress of the fierce competition of our times, are earnestly invited to make themselves acquainted with the work of the Institute, and to contribute to its funds. Eighty-one thousand members and students have joined since it was moved to the Polytechnic, 309 Regent Street, in 1882. All donations or subscriptions will be thankfully received there, or by Mr. Quintin Hogg, 3 Cavendish Square, W.

THE GEOGRAPHICAL DISTRIBUTION OF THE FAMILY CHARADRIIDÆ.

The Geographical Distribution of the Family Charadriidæ; or the Plovers, Sandpipers, Snipes, and their Allies. By Henry Seebohm. (London: H. Sotheran and Co., 1888.)

THIS is a handsome volume of more than 500 pages, and it is illustrated by twenty-one coloured plates, drawn in Mr. Keuleman's best style. Mr. Seebohm has eschewed giving much information as to the habits of these families of wading birds, and has made a special point of the geographical distribution, a branch of the subject which cannot fail to attract the interest of every true naturalist. The introductory chapters treat of (1) the "Classification," and (2) the "Evolution" of Birds. Chapter III. details the author's views on the "Differentiation of Species," and Chapter IV. deals with the "Glacial Epoch." Chapters V. to IX. are devoted to the migration of birds, and end with a scheme of classification of the *Charadriidæ*. Here are, in fact, enunciated clearly all the articles of the Seebohm faith!

Evolutionists will probably join issue with Mr. Seebohm on many of his conclusions, and geologists may have something to say as to the possibility of glacial epochs causing all that the author claims for them, but ornithologists are scarcely likely to accept all his conclusions at once. If we are to believe Mr. Seebohm, there is very little progress being made in ornithological work in the Old World, his sympathies being evidently more with the American school of ornithologists, for whose method of nomenclature he has great respect. The non-adoption of trinomial principles Mr. Seebohm attributes to the "conservative views of British ornithologists," though he is mindful to add: "It is, however, only fair to remember that much allowance must be made for the narrow, because insular, views of British ornithologists." Shade of Darwin! The author has singled out the present writer as one of those who seem to have had "no definite idea of what they meant by a sub-species"; but we may assure Mr. Seebohm that in 1874 we did *not* use the term of *Gyps hispaniolensis* as a sub-species of *G. fulvus* "in an absolutely arbitrary manner," and we did not expect to find our nomenclature discussed under the heading of a "vague use of trinomials." Our object was to recognize evident facts, but at the same time to retain a binomial form of name for every bird, and the uncertainty which still surrounds the American method of trinomial names has not yet encouraged us to abandon the simpler and decidedly less clumsy way of expression. Surely Mr. Seebohm himself must admit that to have to speak of an Oyster-catcher as *Hæmatopus niger ater* (p. 311) is not an advantage, and this is only one result of pushing trinomial nomenclature to its extreme. There are not wanting signs that the advocates of the system are beginning to groan under the weight of the burden they have placed on their own shoulders; and when the inevitable return to the old simple path of binomial nomenclature takes place, the only tangible result will have been to have weighted the already frightful list of ornithological synonyms with an additional number of long names. Even Mr. Seebohm tries to modify the task of quotation of books by simplifying some titles; as, for instance, when he speaks of "Coues and Co., Check-List" (p. 427), as if the authors of the admirable A.O.U. "Check-List of North American Birds" had formed themselves into a Limited Liability Company for the manufacture of trinomials.

Another point on which Mr. Seebohm may fairly be called to task is for the number of new names which his book propounds. On the back of the title-page he quotes wise saws from the writings of John Ray (1878), A. R. Wallace (1876), and Henry Seebohm (1883), concerning the necessity of having simple names for birds, and those generally understanded of the people. Here are his own words:—"I have adopted a scheme which appears to me to be the most practical method of any which have been suggested. It may not satisfy the requirements of poetical justice; but it is at least consistent with common-sense. I adopt the name which has been *most used* by previous writers. It is not necessary for me to encumber my nomenclature with a third name, either to denote the species to which it refers, or to flatter the vanity of the author who described it: all my names are *auctorum plurimorum*." Either our author had forgotten that he had nailed this flag to the mast when he began the present book, or the system of *auctorum plurimorum* does not suit the *Charadriidæ;* for the next student of these birds will find that for the 235 species enumerated by Mr. Seebohm, he is responsible for giving to sixty-five of them names not previously in vogue; and the number would have been greater, had not Schlegel worked somewhat on the same line of ideas, while many of the trinomial combinations had been anticipated by "Coues and Co."

The book is profusely illustrated by woodcuts, showing the specific characters of the different species, and these will be invaluable to the student of these difficult birds. In fact, no work has ever been so remarkably treated in this respect, and it will be the book of reference for the *Charadriidæ* for many years to come. The "Keys to the Species" are also excellent, and Mr. Seebohm deserves every credit for having given us such a complete arrangement of some of the most tiresome of all the birds which it falls to the lot of the ornithologist to determine. Every naturalist who works out his facts as completely as the author has done is permitted to account for them by any theory which seems to him good; and Mr. Seebohm's arguments as to the origin of the species and their distribution are not only examples of clever writing, but are plausible enough if once the absolute certainty of the *Charadriidæ* having been driven from the Polar Basin by successive glacial epochs is conceded. Many ornithologists, however, will think that he carries his theory a little too far, as, for instance, when he places the Avocets and Stilts in one genus, *Himantopus*. How they originally came from the north, were split up in bands, became some of them "semi-Stilts" and "semi-Avocets"; how they thought nothing of emigrating (cause not hinted at) from the New World across the Atlantic to the Canary Islands and Spain, or from the Chilian sub-region across the Pacific to New Zealand and Australia—these and many other interesting theories of distribution will reward the student of Mr. Seebohm's book. Most ornithologists will be more grateful for small mercies than Mr. Seebohm is, and thank Dame Nature for having given them characters whereby in a few lines a genus can be written down. Take, for instance, the members of the genus *Esacus*, which Mr. Seebohm unites to *Œdicnemus*, and yet his woodcuts show that the former genus has an enormous bill, longer than the head itself—surely a genuine character of importance. Then, again, *Anarhynchus*, with its asymmetrical bill—confined to New Zealand—need not be united to *Charadrius;*—and so on. With his theory of distribution strong in his mind, the Avocets, with up-turned bill, are united to the Stilts, with their straight bill, because Mr. Seebohm has no doubts as to their common origin in the distant past; but looking at the present almost identical distribution of *Himantopus melanopterus* and *Recurvirostra avocetta*, *H. mexicanus* and *R. americana*, it would seem as if they had long ago been separated as distinct generic forms, as they would have no business to occupy the same areas, if Mr. Seebohm's theory were true. Is it not possible that they were developed as Avocets and Stilts in very remote times, and that similar causes have driven them to occupy the same areas of distribution? And may not both have had a *southern* instead of a northern origin? Thus *Cladorhynchus* in Australia, *Himantopus andinus* in the Andes (apparently, from Mr. Seebohm's illustration, belonging to a distinct genus), and the various species of Stilts in Australia, New Zealand, and Brazil, would remain as isolated species of a former stock, which probably inhabited a continuous area in the South Atlantic and South Pacific Oceans. Where circumstances were favourable to their stay, some may not have migrated northwards, and the differences in some of the southern species could be accounted for by their subsequent isolation, rather than by their inconsequent flight from Chili to New Zealand, as Mr. Seebohm supposes.

Besides the woodcuts of heads, tails, &c., and other specific characters, the present volume is crowded with woodcut illustrations by Mr. John Millais, Mr. Lodge, and Mr. Holding. They are mostly extremely well done, but Mr. Millais seems a little inclined to fashion his Waders on the model of a peg-top.

R. BOWDLER SHARPE.

THE MINERALS OF NEW SOUTH WALES.

The Minerals of New South Wales, &c. By A. Liversidge, M.A., F.R.S., Professor of Chemistry and Mineralogy in the University of Sydney. (London: Trübner and Co., Ludgate Hill, 1888)

IT was a very happy thought of Prof. Liversidge to celebrate the centenary of the foundation of the colony of New South Wales by the publication of this handsome and comprehensive volume. Giving, as it does, a very clear account of what is known of the mineral resources of the oldest of the Australian colonies, it brings clearly before the mind of the reader how much has already been accomplished in developing the subterranean resources of an important part of the British Empire, and how large is the promise for the future. The term "mineral," we may mention, is not employed in this work in its narrower scientific sense; coals and oil-shales, and even mineral waters, receiving a due amount of notice in it.

The basis of the present work is found in a paper published by the author in the Transactions of the Royal Society of New South Wales, in 1874, of which memoir a second edition was published by the Mining Department of the colony in 1882. Prof. Liversidge has added very largely to his original memoir; and the numerous analyses of minerals and rocks, made by himself, Mr. W. J. Dixon, F.I.C., and the Government Analyst of the Mining Department, greatly increase the value of the book. Owing to the absence of the author from the colony during the past year, the work has been printed and issued in this country; but, as a proof of the manner in which the book has been brought fully up to date, we may note the statement, on p. 185, of the discovery, by Mr. T. W. Edgworth David, of the Geological Survey of New South Wales, of the sparsely distributed mineral leucite in the Australian colony, the fact having only been announced to the Mineralogical Society so recently as October in last year.

A considerable amount of space is naturally devoted to discussions concerning the occurrence of the precious metals—the account of gold occupying 34 pages, and that of silver 13 pages. The interesting series of assays of New South Wales gold, and an account of the chief nuggets found in the colony, are of much interest. In connection with this subject, we have in the work before us a very clear and concise, but very carefully drawn up, statement concerning the often-disputed question of the original discoverer of gold in Australia. The author states his facts and sources of information, taking great care to give references in all cases, and those interested in the question will have little difficulty in arriving at a decision as to the relative merits of the claims which have been put forward on behalf of Count Strzelecki, the Rev. W. B. Clarke, Sir Roderick Murchison, and other less known individuals, to whom the discovery has been ascribed. One of the most interesting and instructive among the many tabular statements in this work is that which indicates the number of minerals which have yielded, on assay, larger or smaller quantities of gold and silver. This table seems to indicate that, even should the alluvial washings and quartz-reefs be exhausted of their auriferous contents, there still remain in Australia many available and very valuable sources of the precious metals.

Still more important in its bearing on the future welfare of the colony is the account of the common metallic ores, and of the coal, lignite, and oil-shale deposits. There are few, if any, of the metals used in the arts, of which abundant sources of supply are not found within the limits of the colony. The coal-fields are said to cover about one-half the area of those of Great Britain, and numerous analyses and other details enable us to judge of the quality of the fuels which they yield. In the discussion of this important question, Prof. Liversidge's great knowledge and experience as a chemist invest his opinions with the highest value.

Although the book is not a technical mineralogical treatise alone, mineralogists will find very careful descriptions of all the minerals, including the gem stones, which have been found within the colony. Their study of the subject will be much facilitated by the large coloured map which forms a frontispiece to the volume.

In concluding this notice we cannot but congratulate the author upon the enterprise and energy which have enabled him to prepare such a treatise as the present one. The objects aimed at in such books as Zepharovic's "Mineralogisches Lexicon für das Kaiserthum Oesterreich" may seem at first sight incompatible with those to which works like Mr. Albert Williams's "Mineral Resources of the United States" are devoted; but Prof. Liversidge has shown that this is by no means the case, and he has achieved the feat in the case of a young and rising colony, where the difficulties of the undertaking must have been more than usually great. The colony,